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To: Steve Morrow
From: Chris Ricardi
Date: June 30, 2010
Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 1Q10– February 2010

**DATA VALIDATION REPORT
FEBRUARY 2010 SLURRY WALL SURFACE WATER AND GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS
TestAmerica Laboratories Data Sets 360-26874-1, 360-26898-1**

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site from February 15 to February 18, 2010. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-26874-1 and 360-26898-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2. Validation reason codes were associated with final results that have been qualified. Table 3 presents analytical results that were qualified and the associated reason codes.

With the exception of the data qualification items discussed in the sections below, results are determined to be usable as reported by the laboratory.

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time

- Blanks
- * Matrix Spike Analysis
- * Field Duplicate Results
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- * Detection Limits
- Dissolved vs. Total Metals Comparison

* = indicates that criteria were met for this parameter

Blanks

A low level detection of chromium (1.6 µg/L) was reported in the method blank associated with a subset of surface water samples in SDG 360-26898-1. The chromium results in associated samples were qualified (B) by the lab to identify the associated blank detection. Sample results were greater than the 5X the blank concentration and the B qualifiers were removed from chromium results in the final data set.

Dissolved vs. Total Metals Comparison

Dissolved sodium concentrations were over ten percent greater than total sodium concentrations in a subset of surface water samples in SDG 360-26898-1. The results for total and dissolved sodium in samples OC-SW-SD-17-0.2 and OC-SW-ISCO-1-0.2 were qualified estimated J.

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- * Matrix Spike Analysis
- * Field Duplicate Analysis
- * Laboratory Duplicate Analysis
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- Detection Limits

* = indicates that criteria were met for this parameter

Detection Limits

The reporting limits for nitrite in samples OC-SW-SD-17-0.2 and OC-SW-PZ-16RR-0.2-DUP were elevated above the project goal of 0.01 mg/L to 0.1 mg/L due to a 10X dilution.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.



6/30/10

Chris Ricardi, NRCC-EAC
Senior Chemist

Date



Michael Murphy
Project Principal

Date

References:

- American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.
- MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.
- Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.
- U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).
- U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary - 360-26874-1 360-26898-1
Data Validation Report
February 2010 Slurry Wall Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				SW846 6010B Total	SW846 6010B Filtered	E350.1 (QuickChem 10-107-06-1-B)	SM 2510B	40CFR136A 300.0
Lab Sample ID	Location	Sample ID	Sample Date					
<i>Slurry Wall / Cap Groundwater</i>								
360-26874-5	GW-202D	OC-GW-202D	2/17/2010		2	1	1	2
360-26874-3	GW-202S	OC-GW-202S	2/17/2010		2	1	1	2
360-26874-4	GW-202S	OC-GW-202S-DUP	2/17/2010		2	1	1	2
360-26874-2	GW-25	OC-GW-25	2/15/2010		2	1	1	2
360-26874-7	GW-78S	OC-GW-78S	2/17/2010		2	1	1	2
360-26874-6	GW-79S	OC-GW-79S	2/17/2010		2	1	1	2
360-26874-1	PZ-17RR	OC-PZ-17RR	2/15/2010		2	1	1	2
<i>Slurry Wall / Cap Surface Water</i>								
360-26898-8	ISCO1	OC-SW-ISCO-1-0.2	2/18/2010	3	3	1	1	4
360-26898-2	ISCO2	OC-SW-ISCO-2-0.2	2/18/2010	3	3	1	1	4
360-26898-1	ISCO3	OC-SW-ISCO-3-0.2	2/18/2010	3	3	1	1	4
360-26898-3	PZ-16RR	OC-SW-PZ-16RR-0.2	2/18/2010	3	3	1	1	4
360-26898-4	PZ-16RR	OC-SW-PZ-16RR-0.2-DUP	2/18/2010	3	3	1	1	4
360-26898-5	PZ-17RR	OC-SW-PZ-17RR-0.2	2/18/2010	3	3	1	1	4
360-26898-7	PZ-18R	OC-SW-PZ-18R-0.2	2/18/2010	3	3	1	1	4
360-26898-6	SD-17	OC-SW-SD-17-0.2	2/18/2010	3	3	1	1	4

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 03/05/10

Checked by / Date: TLC 06/22/10

Table 2
Final Results Summary - 360-26874 & 360-26898
February 2010 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				GW-202D		GW-202S		GW-202S		GW-25		GW-78S		GW-79S		PZ-17RR	
				Field Sample ID		Field Sample ID		Field Sample ID		Field Sample ID		Field Sample ID		Field Sample ID		Field Sample ID	
				Field Sample Date		Field Sample Date		Field Sample Date		Field Sample Date		Field Sample Date		Field Sample Date		Field Sample Date	
				QC Code		QC Code		QC Code		QC Code		QC Code		QC Code		QC Code	
				Lab Sample Delivery Group		Lab Sample Delivery Group		Lab Sample Delivery Group		Lab Sample Delivery Group		Lab Sample Delivery Group		Lab Sample Delivery Group		Lab Sample Delivery Group	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	17000		100 U		100 U		100 U		100 U		100 U		100 U	
F	SW6010	Chromium	ug/l	1200		4.2 J		4.2 J		2.6 J		1.7 J		8.9		3.1 J	
N	E300	Chloride	mg/l	320		44		44		41		21		200		19	
N	E300	Sulfate	mg/l	2300		400		410		100		530		1500		470	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	300		69		69		38		56		180		57	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	4600		1200		1200		570		1300		3300		1400	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 06/24/10

Checked by / Date: TLC 06/24/10

Table 2
Final Results Summary - 360-26874 & 360-26898
February 2010 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	ISCO1		ISCO2		ISCO3		PZ-16RR		PZ-16RR		PZ-17RR	
			Field Sample ID	OC-SW-ISCO-1-0.2		OC-SW-ISCO-2-0.2		OC-SW-ISCO-3-0.2		OC-SW-PZ-16RR-0.2		OC-SW-PZ-16RR-0.2-DUP		OC-SW-PZ-17RR-0.2	
			Field Sample Date	02/18/10		02/18/10		02/18/10		02/18/10		02/18/10		02/18/10	
			QC Code	FS		FS		FS		FS		FD		FS	
			Lab Sample Delivery Group	360-26898-1		360-26898-1		360-26898-1		360-26898-1		360-26898-1		360-26898-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	110		510		100 U		220		210		130	
F	SW6010	Chromium	ug/l	19		170		5 U		130		120		83	
F	SW6010	Sodium	ug/l	130000 J		170000		81000		160000		160000		150000	
N	E300	Chloride	mg/l	220		220		160		240		240		230	
N	E300	Nitrate as N	mg/l	0.76		0.94		1.2		2.4		2.4		3.3	
N	E300	Nitrite as N	mg/l	0.01 U		0.01 U		0.01 U		0.01 U		0.1 U		0.01 U	
N	E300	Sulfate	mg/l	80		450		46		320		310		210	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	14		72		3.1		40		43		33	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	940		1700		700		1500		1500		1300	
T	SW6010	Aluminum	ug/l	130		3900		91 J		5300		4800		2600	
T	SW6010	Chromium	ug/l	20		810		5 U		1200		1100		630	
T	SW6010	Sodium	ug/l	110000 J		160000		77000		160000		160000		140000	

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary - 360-26874 & 360-26898
February 2010 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name	PZ-18R		SD-17	
				Field Sample ID	OC-SW-PZ-18R-0.2		OC-SW-SD-17-0.2	
				Field Sample Date	02/18/10		02/18/10	
				QC Code	FS		FS	
				Lab Sample Delivery Group	360-26898-1		360-26898-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	
F	SW6010	Aluminum	ug/l	120		150		
F	SW6010	Chromium	ug/l	20		60		
F	SW6010	Sodium	ug/l	130000		150000	J	
N	E300	Chloride	mg/l	220		240		
N	E300	Nitrate as N	mg/l	0.69		3.6		
N	E300	Nitrite as N	mg/l	0.01	U	0.1	U	
N	E300	Sulfate	mg/l	86		200		
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	16		48		
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	950		1300		
T	SW6010	Aluminum	ug/l	140		4600		
T	SW6010	Chromium	ug/l	22		840		
T	SW6010	Sodium	ug/l	120000		130000	J	

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 06/24/10

Checked by / Date: TLC 06/24/10

Table 3
Validation Qualification Action Summary - 360-26874 & 360-26898
Data Validation Report
February 2010 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Analytical Method	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
360-26898-1	360-26898-6	SW6010	OC-SW-SD-17-0.2	Sodium	150000		150000	J	TD	ug/l
360-26898-1	360-26898-6	SW6010	OC-SW-SD-17-0.2	Sodium	130000		130000	J	TD	ug/l
360-26898-1	360-26898-8	SW6010	OC-SW-ISCO-1-0.2	Sodium	130000		130000	J	TD	ug/l
360-26898-1	360-26898-8	SW6010	OC-SW-ISCO-1-0.2	Sodium	110000		110000	J	TD	ug/l

J - Value is estimated

TD - Dissolved concentration exceeds total

ug/L - microgram per liter

Prepared by / Date: KJC 06/24/10

Checked by / Date: TLC 06/24/10

ANALYTICAL REPORT

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:

[Signature] G-29-10

Job Number: 360-26874-1

Job Description: Quarterly Groundwater

For:

Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

Joseph A. Chimi

Approved for release.
Joe Chimi
Report Production Representative
3/2/10 3:04 PM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
03/02/2010

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085
Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-26874-1**

Project Location: MADEP RTN¹:

This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)]
360-26874-8

Sample Matrices:	Groundwater	Soil/Sediment		Drinking Water	Other:	
MCP SW-846	8260B(x)	8151A ()	8330 ()	6010B ()	7470A/1A ()	Other ()
Methods Used	8270C ()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()	
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()	
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.						

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 3/2/10 14:56

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-26874-1																
Project Location: MADEP RTN¹:																	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-26874-8																	
Sample Matrices:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Groundwater</td> <td style="width: 25%;">Soil/Sediment</td> <td style="width: 25%;">Drinking Water</td> <td style="width: 25%;">Other:</td> </tr> <tr> <td>MCP SW-846</td> <td>8260B ()</td> <td>8151A ()</td> <td>8330 ()</td> </tr> <tr> <td>Methods Used</td> <td>8270C (x)</td> <td>8081A ()</td> <td>VPH ()</td> </tr> <tr> <td>As specified in MADEP Compendium of Analytical Methods. (check all that apply)</td> <td>8082 ()</td> <td>8021B ()</td> <td>EPH ()</td> </tr> </table>	Groundwater	Soil/Sediment	Drinking Water	Other:	MCP SW-846	8260B ()	8151A ()	8330 ()	Methods Used	8270C (x)	8081A ()	VPH ()	As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()
Groundwater	Soil/Sediment	Drinking Water	Other:														
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An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes	No ¹ √
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes	N/A No ¹ √

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 3/2/10 14:56

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
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NELAP FL E87912 TOX
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TestAmerica Westfield
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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-26874-1**

Project Location: MADEP RTN¹:

This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)]
360-26874-8

Sample Matrices:	Groundwater	Soil/Sediment		Drinking Water	Other:	
MCP SW-846	8260B ()	8151A ()	8330 ()	6010B ()	7470A/1A ()	Other ()
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An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

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B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

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I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

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CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
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NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
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Fax:(413)572-3707

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-26874-1**

Project Location: MADEP RTN¹:

This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)]
360-26874-(1-8)

Sample Matrices:	Groundwater	Soil/Sediment		Drinking Water	Other:	
MCP SW-846 Methods Used	8260B()	8151A ()	8330 ()	6010B (x)	7470A/1A ()	Other ()
	8270C()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()	
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()	
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.						

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 3/2/10 14:56

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-26874-1**

Project Location: MADEP RTN¹:

This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)]
360-26874-(1-8)

Sample Matrices:	Groundwater	Soil/Sediment		Drinking Water	Other:	
MCP SW-846	8260B ()	8151A ()	8330 ()	6010B ()	7470A/1A ()	Other (x)
Methods Used	8270C ()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()	
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()	
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.						

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 3/2/10 14:56

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

CASE NARRATIVE

Client: Olin Corporation

Project: Quarterly Groundwater

Report Number: 360-26874-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 02/17/2010; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 1.6 and 0.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2 C of the required temperature or method specified range. For samples with a specified temperature of 4 C, samples with a temperature ranging from just above freezing temperature of water to 6 C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample 360-26874-8 was analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The sample was analyzed on 02/19/2010.

Sample 360-26874-8(25X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

The LCS was used as the CCV.

At the request of the client, a non-MCP analyte list was reported for this job.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample 360-26874-8 was analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 8270C LL. The sample was prepared on 02/23/2010 and analyzed on 03/02/2010.

Phenol-d5 failed the surrogate recovery criteria low for 360-26874-8, LCS 360-55338/2-A and LCSD 360-55338/3-A. Refer to the QC report for details. In all cases, the recovery of Phenol-d5 was at or above 10%. Per method SOP, re-extraction is only required if two or more surrogates from any one fraction fail or any single surrogate falls below 10%.

Bis(2-ethylhexyl) phthalate was detected in method blank MB 360-55338/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

At the request of the client, an abbreviated MCP analyte list was reported for this job.

No other difficulties were encountered during the semivolatiles analysis.

All other quality control parameters were within the acceptance limits.

VOLATILE PETROLEUM HYDROCARBONS

Sample 360-26874-8 was analyzed for Volatile Petroleum Hydrocarbons in accordance with MADEP VPH. The sample was analyzed on 02/19/2010.

Sample 360-26874-8(4X) required dilution prior to analysis due to foaming. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the VPH analysis.

All quality control parameters were within the acceptance limits.

DISSOLVED METALS

Samples 360-26874-1 through 360-26874-8 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 02/19/2010.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

ANIONS

Samples 360-26874-1 through 360-26874-7 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 02/18/2010 and 02/19/2010.

Samples 360-26874-1(10X), 360-26874-3 through 360-26874-5(10X), 360-26874-5(50X), 360-26874-6(10X), 360-26874-6(50X) and 360-26874-7(10X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples 360-26874-1 through 360-26874-8 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 02/22/2010.

Samples 360-26874-1 through 360-26874-4(10X), 360-26874-5(20X), 360-26874-6(20X) and 360-26874-7(10X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTANCE

Samples 360-26874-1 through 360-26874-7 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 02/18/2010.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

PH

Sample 360-26874-8 was analyzed for pH in accordance with SM 4500 H+. The sample was analyzed on 02/18/2010.

No difficulties were encountered during the pH analysis.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-26874-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
360-26874-1	OC-PZ-17RR					
Sulfate		470		20	mg/L	300.0
Chloride		19		1.0	mg/L	300.0
Ammonia		57		1.0	mg/L	L107-06-1B
Specific Conductance		1400		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		3.1	J	5.0	ug/L	6010B
360-26874-2	OC-GW-25					
Sulfate		100		2.0	mg/L	300.0
Chloride		41		1.0	mg/L	300.0
Ammonia		38		1.0	mg/L	L107-06-1B
Specific Conductance		570		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		2.6	J	5.0	ug/L	6010B
360-26874-3	OC-GW-202S					
Sulfate		400		20	mg/L	300.0
Chloride		44		1.0	mg/L	300.0
Ammonia		69		1.0	mg/L	L107-06-1B
Specific Conductance		1200		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		4.2	J	5.0	ug/L	6010B
360-26874-4	OC-GW-202S-DUP					
Sulfate		410		20	mg/L	300.0
Chloride		44		1.0	mg/L	300.0
Ammonia		69		1.0	mg/L	L107-06-1B
Specific Conductance		1200		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		4.2	J	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-26874-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-26874-5	OC-GW-202D				
Sulfate		2300	100	mg/L	300.0
Chloride		320	10	mg/L	300.0
Ammonia		300	2.0	mg/L	L107-06-1B
Specific Conductance		4600	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		17000	100	ug/L	6010B
Chromium		1200	5.0	ug/L	6010B
360-26874-6	OC-GW-79S				
Sulfate		1500	100	mg/L	300.0
Chloride		200	10	mg/L	300.0
Ammonia		180	2.0	mg/L	L107-06-1B
Specific Conductance		3300	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		8.9	5.0	ug/L	6010B
360-26874-7	OC-GW-78S				
Sulfate		530	20	mg/L	300.0
Chloride		21	1.0	mg/L	300.0
Ammonia		56	1.0	mg/L	L107-06-1B
Specific Conductance		1300	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		1.7 J	5.0	ug/L	6010B
360-26874-8	OC-GW-16R				
2,4,4-Trimethyl-1-pentene		1700	25	ug/L	8260B
2,4,4-Trimethyl-2-pentene		490	25	ug/L	8260B
Bis(2-ethylhexyl) phthalate		0.81 J B	1.8	ug/L	8270C LL
C5-C8 Aliphatics (unadjusted)		1800	200	ug/L	MAVPH
C5-C8 Aliphatics (adjusted)		1800	200	ug/L	MAVPH
Total VPH		1800	200	ug/L	MAVPH
Ammonia		6.7	0.10	mg/L	L107-06-1B
pH		6.55 HF	0.100	SU	SM 4500 H+ B
<i>Dissolved</i>					
Iron		1800	100	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-26874-1

Description		Lab Location	Method	Preparation Method
Matrix	Water			
Volatil Organic Compounds (Custom List)		TAL WFD	SW846 8260B	
Purge and Trap		TAL WFD		SW846 5030B
Semivolatil Organic Compounds by GCMS - Low Levels		TAL WFD	SW846 8270C LL	
Liquid-Liquid Extraction (Separatory Funnel)		TAL WFD		SW846 3510C
Massachusetts - Volatile Petroleum Hydrocarbons (GC)		TAL WFD	MA DEP MAVPH	
Purge and Trap		TAL WFD		SW846 5030B
Dissolved Metals		TAL WFD	SW846 6010B	
Sample Filtration, Field		TAL WFD		FIELD_FLTRD
Chloride & Sulfate		TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia		TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia		TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance		TAL WFD	SM SM 2510B	
pH		TAL WFD	SM SM 4500 H+ B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-26874-1

Method	Analyst	Analyst ID
SW846 8260B	Tester, Carla	CT
SW846 8270C LL	Sullivan, Pat J	PJS
MA DEP MAVPH	Rouleau, Catherine M	CMR
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE
SM SM 4500 H+ B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-26874-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-26874-1	OC-PZ-17RR	Water	02/15/2010 1420	02/17/2010 1640
360-26874-2	OC-GW-25	Water	02/15/2010 1435	02/17/2010 1640
360-26874-3	OC-GW-202S	Water	02/17/2010 0940	02/17/2010 1640
360-26874-4	OC-GW-202S-DUP	Water	02/17/2010 0940	02/17/2010 1640
360-26874-5	OC-GW-202D	Water	02/17/2010 1000	02/17/2010 1640
360-26874-6	OC-GW-79S	Water	02/17/2010 1120	02/17/2010 1640
360-26874-7	OC-GW-78S	Water	02/17/2010 1125	02/17/2010 1640
360-26874-8	OC-GW-16R	Water	02/17/2010 1355	02/17/2010 1640

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-26874-1

Date Sampled: 02/15/2010 1420
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 02/19/2010 1113		
Aluminum	ND	ug/L	39	100	1.0
Chromium	3.1 J	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-26874-1

Date Sampled: 02/15/2010 1420
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	19	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	470	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia	57	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-26874-2

Date Sampled: 02/15/2010 1435
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	02/19/2010 1125	
Aluminum	ND	ug/L	39	100	1.0
Chromium	2.6 J	ug/L	1.3	5.0	1.0

TS
6-22-10

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-26874-2

Date Sampled: 02/15/2010 1435
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	100	mg/L	2.0	2.0	1.0
Chloride	41	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	38	mg/L	1.0	1.0	10
Method: SM 2510B					
Specific Conductance	570	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-26874-3

Date Sampled: 02/17/2010 0940
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 02/19/2010 1128		
Aluminum	ND	ug/L	39	100	1.0
Chromium	4.2 J	ug/L	1.3	5.0	1.0

TC
6-22-10

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-26874-3

Date Sampled: 02/17/2010 0940
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	44	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	400	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	69	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202S-DUP
Lab Sample ID: 360-26874-4

Date Sampled: 02/17/2010 0940
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 02/19/2010 1136		
Aluminum	ND	ug/L	39	100	1.0
Chromium	4.2 J	ug/L	1.3	5.0	1.0

TC
6-22-10

Mr. Steven Morrow
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3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202S-DUP
Lab Sample ID: 360-26874-4

Date Sampled: 02/17/2010 0940
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	44	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	410	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	69	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
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Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-26874-5

Date Sampled: 02/17/2010 1000
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 02/19/2010 1139		
Aluminum	17000	ug/L	39	100	1.0
Chromium	1200	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-26874-5

Date Sampled: 02/17/2010 1000
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	320	mg/L	10	10	10
Method: 300.0 Sulfate	2300	mg/L	100	100	50
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	300	mg/L	2.0	2.0	20
Method: SM 2510B Specific Conductance	4600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-26874-6

Date Sampled: 02/17/2010 1120
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 02/19/2010 1142		
Aluminum	ND	ug/L	39	100	1.0
Chromium	8.9	ug/L	1.3	5.0	1.0

TC
6-22-10

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-26874-6

Date Sampled: 02/17/2010 1120
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	200	mg/L	10	10	10
Method: 300.0 Sulfate	1500	mg/L	100	100	50
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	180	mg/L	2.0	2.0	20
Method: SM 2510B Specific Conductance	3300	umhos/cm	1.0	1.0	1.0

TC
6-22-10

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-26874-7

Date Sampled: 02/17/2010 1125
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B					
		Date Analyzed:	02/19/2010 1145		
Aluminum	ND	ug/L	39	100	1.0
Chromium	1.7 J	ug/L	1.3	5.0	1.0

TC
6-22-10

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-26874-7

Date Sampled: 02/17/2010 1125
Date Received: 02/17/2010 1640
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	21	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	530	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	56	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

TC
6-22-10

Mr. Steven Morrow
 Olin Corporation
 3855 North Ocoee Street
 Suite 200
 Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-16R
 Lab Sample ID: 360-26874-8

Date Sampled: 02/17/2010 1355
 Date Received: 02/17/2010 1640
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 8260B					
			Date Analyzed:	02/19/2010 1911	
Prep Method: 5030B			Date Prepared:	02/19/2010 1911	
2,4,4-Trimethyl-1-pentene	1700	ug/L	20	25	25
2,4,4-Trimethyl-2-pentene	490	ug/L	12	25	25
Surrogate	Acceptance Limits				
4-Bromofluorobenzene	103	%		70 - 130	
Dibromofluoromethane	125	%		70 - 130	
Toluene-d8 (Surr)	100	%		70 - 130	
Method: 8270C LL					
Prep Method: 3510C			Date Analyzed:	03/02/2010 0620	
			Date Prepared:	02/23/2010 1148	
Bis(2-ethylhexyl) phthalate	0.81 ND JB	ug/L	0.45	1.8	1.0
N-Nitrosodiphenylamine	ND	ug/L	0.45	4.5	1.0
Surrogate	Acceptance Limits				
2,4,6-Tribromophenol	91	%		15 - 110	
2-Fluorobiphenyl	77	%		30 - 130	
2-Fluorophenol	24	%		15 - 110	
Nitrobenzene-d5	91	%		30 - 130	
Phenol-d5	13	%	X	15 - 110	
Terphenyl-d14	88	%		30 - 130	
Method: Dissolved-6010B					
			Date Analyzed:	02/19/2010 1148	
Iron	1800	ug/L	34	100	1.0

TC
 9/18/10

Mr. Steven Morrow
 Olin Corporation
 3855 North Ocoee Street
 Suite 200
 Cleveland, TN 37312-4441

Job Number: 360-26874-1

Client Sample ID: OC-GW-16R
 Lab Sample ID: 360-26874-8

Date Sampled: 02/17/2010 1355
 Date Received: 02/17/2010 1640
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: MAVPH		Date Analyzed:		02/19/2010 0224	
Prep Method: 5030B		Date Prepared:		02/19/2010 0224	
Benzene	ND	ug/L	4.0	4.0	4.0
Ethylbenzene	ND	ug/L	4.0	4.0	4.0
m-Xylene & p-Xylene	ND	ug/L	8.0	8.0	4.0
Methyl tert-butyl ether	ND	ug/L	4.0	4.0	4.0
Naphthalene	ND	ug/L	20	20	4.0
o-Xylene	ND	ug/L	4.0	4.0	4.0
Toluene	ND	ug/L	4.0	4.0	4.0
C5-C8 Aliphatics (unadjusted)	1800	ug/L	200	200	4.0
C9-C12 Aliphatics (unadjusted)	ND	ug/L	200	200	4.0
C5-C8 Aliphatics (adjusted)	1800	ug/L	200	200	4.0
C9-C12 Aliphatics (adjusted)	ND	ug/L	200	200	4.0
C9-C10 Aromatics	ND	ug/L	200	200	4.0
Total VPH	1800	ug/L	200	200	4.0
Surrogate			Acceptance Limits		
2,5-Dibromotoluene (fid)	95	%	70 - 130		
2,5-Dibromotoluene (pid)	87	%	70 - 130		
Method: L107-06-1B		Date Analyzed:		02/22/2010 1146	
Prep Method: Distill/Ammonia		Date Prepared:		02/22/2010 0913	
Ammonia	6.7	mg/L	0.10	0.10	1.0
Method: SM 4500 H+ B		Date Analyzed:		02/18/2010 1037	
pH	6.55 J HF	SU	0.100	0.100	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-26874-1

Lab Section	Qualifier	Description
GC/MS Semi VOA	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	X	Surrogate exceeds the control limits
Metals	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry	HF	Field parameter with a holding time of 15 minutes

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:360-55272					
LCS 360-55272/3	Lab Control Sample	T	Water	8260B	
LCSD 360-55272/4	Lab Control Sample Duplicate	T	Water	8260B	
MB 360-55272/6	Method Blank	T	Water	8260B	
360-26874-8	OC-GW-16R	T	Water	8260B	

Report Basis

T = Total

GC/MS Semi VOA

Prep Batch: 360-55338					
LCS 360-55338/2-A	Lab Control Sample	T	Water	3510C	
LCSD 360-55338/3-A	Lab Control Sample Duplicate	T	Water	3510C	
MB 360-55338/1-A	Method Blank	T	Water	3510C	
360-26874-8	OC-GW-16R	T	Water	3510C	
Analysis Batch:360-55513					
LCS 360-55338/2-A	Lab Control Sample	T	Water	8270C LL	360-55338
LCSD 360-55338/3-A	Lab Control Sample Duplicate	T	Water	8270C LL	360-55338
MB 360-55338/1-A	Method Blank	T	Water	8270C LL	360-55338
360-26874-8	OC-GW-16R	T	Water	8270C LL	360-55338

Report Basis

T = Total

GC VOA

Analysis Batch:360-55210					
LCS 360-55210/3	Lab Control Sample	T	Water	MAVPH	
LCSD 360-55210/4	Lab Control Sample Duplicate	T	Water	MAVPH	
MB 360-55210/6	Method Blank	T	Water	MAVPH	
360-26874-8	OC-GW-16R	T	Water	MAVPH	

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report		Method	Prep Batch
		Basis	Client Matrix		
Metals					
Analysis Batch:360-55244					
LCS 360-55244/13	Lab Control Sample	T	Water	6010B	
LCSD 360-55244/25	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-55244/14	Method Blank	T	Water	6010B	
360-26874-1	OC-PZ-17RR	D	Water	6010B	
360-26874-1DU	Duplicate	D	Water	6010B	
360-26874-1MS	Matrix Spike	D	Water	6010B	
360-26874-2	OC-GW-25	D	Water	6010B	
360-26874-3	OC-GW-202S	D	Water	6010B	
360-26874-4	OC-GW-202S-DUP	D	Water	6010B	
360-26874-5	OC-GW-202D	D	Water	6010B	
360-26874-6	OC-GW-79S	D	Water	6010B	
360-26874-7	OC-GW-78S	D	Water	6010B	
360-26874-8	OC-GW-16R	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report		Method	Prep Batch
		Basis	Client Matrix		
General Chemistry					
Analysis Batch:360-55177					
LCS 360-55177/1	Lab Control Sample	T	Water	SM 2510B	
MB 360-55177/4	Method Blank	T	Water	SM 2510B	
360-26874-1	OC-PZ-17RR	T	Water	SM 2510B	
360-26874-2	OC-GW-25	T	Water	SM 2510B	
360-26874-3	OC-GW-202S	T	Water	SM 2510B	
360-26874-4	OC-GW-202S-DUP	T	Water	SM 2510B	
360-26874-5	OC-GW-202D	T	Water	SM 2510B	
360-26874-6	OC-GW-79S	T	Water	SM 2510B	
360-26874-7	OC-GW-78S	T	Water	SM 2510B	
Analysis Batch:360-55179					
LCS 360-55179/2	Lab Control Sample	T	Water	SM 4500 H+ B	
360-26874-8	OC-GW-16R	T	Water	SM 4500 H+ B	
Analysis Batch:360-55231					
LCS 360-55231/4	Lab Control Sample	T	Water	300.0	
MB 360-55231/3	Method Blank	T	Water	300.0	
360-26874-1	OC-PZ-17RR	T	Water	300.0	
360-26874-1MS	Matrix Spike	T	Water	300.0	
360-26874-1MSD	Matrix Spike Duplicate	T	Water	300.0	
360-26874-2	OC-GW-25	T	Water	300.0	
360-26874-3	OC-GW-202S	T	Water	300.0	
360-26874-4	OC-GW-202S-DUP	T	Water	300.0	
360-26874-5	OC-GW-202D	T	Water	300.0	
360-26874-6	OC-GW-79S	T	Water	300.0	
360-26874-7	OC-GW-78S	T	Water	300.0	
Analysis Batch:360-55283					
LCS 360-55283/4	Lab Control Sample	T	Water	300.0	
MB 360-55283/3	Method Blank	T	Water	300.0	
360-26874-5	OC-GW-202D	T	Water	300.0	
360-26874-6	OC-GW-79S	T	Water	300.0	
Prep Batch: 360-55290					
LCS 360-55290/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-55290/1-A	Method Blank	T	Water	Distill/Ammonia	
360-26874-1	OC-PZ-17RR	T	Water	Distill/Ammonia	
360-26874-2	OC-GW-25	T	Water	Distill/Ammonia	
360-26874-3	OC-GW-202S	T	Water	Distill/Ammonia	
360-26874-4	OC-GW-202S-DUP	T	Water	Distill/Ammonia	
360-26874-5	OC-GW-202D	T	Water	Distill/Ammonia	
360-26874-6	OC-GW-79S	T	Water	Distill/Ammonia	
360-26874-7	OC-GW-78S	T	Water	Distill/Ammonia	
360-26874-8	OC-GW-16R	T	Water	Distill/Ammonia	

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report			
		Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-55296					
LCS 360-55290/2-A	Lab Control Sample	T	Water	L107-06-1B	360-55290
MB 360-55290/1-A	Method Blank	T	Water	L107-06-1B	360-55290
360-26874-1	OC-PZ-17RR	T	Water	L107-06-1B	360-55290
360-26874-2	OC-GW-25	T	Water	L107-06-1B	360-55290
360-26874-3	OC-GW-202S	T	Water	L107-06-1B	360-55290
360-26874-4	OC-GW-202S-DUP	T	Water	L107-06-1B	360-55290
360-26874-5	OC-GW-202D	T	Water	L107-06-1B	360-55290
360-26874-6	OC-GW-79S	T	Water	L107-06-1B	360-55290
360-26874-7	OC-GW-78S	T	Water	L107-06-1B	360-55290
360-26874-8	OC-GW-16R	T	Water	L107-06-1B	360-55290

Report Basis

T = Total

Client: Olin Corporation

Job Number: 360-26874-1

Surrogate Recovery Report

8260B Volatile Organic Compounds (Custom List)

Client Matrix: Water

Lab Sample ID	Client Sample ID	BFB %Rec	DBFM %Rec	TOL %Rec
360-26874-8	OC-GW-16R	103	125	100
MB 360-55272/6		88	120	91
LCS 360-55272/3		105	104	102
LCSD 360-55272/4		102	102	102

Surrogate	Acceptance Limits
BFB = 4-Bromofluorobenzene	70-130
DBFM = Dibromofluoromethane	70-130
TOL = Toluene-d8 (Surr)	70-130

Client: Olin Corporation

Job Number: 360-26874-1

Surrogate Recovery Report

8270C LL Semivolatile Organic Compounds by GCMS - Low Levels

Client Matrix: Water

Lab Sample ID	Client Sample ID	TBP %Rec	FBP %Rec	2FP %Rec	NBZ %Rec	PHL %Rec	TPH %Rec
360-26874-8	OC-GW-16R	91	77	24	91	13X	88
MB 360-55338/1-A		83	77	28	90	17	87
LCS 360-55338/2-A		95	83	23	73	12X	93
LCSD 360-55338/3-A		98	79	23	73	12X	80

Surrogate	Acceptance Limits
TBP = 2,4,6-Tribromophenol	15-110
FBP = 2-Fluorobiphenyl	30-130
2FP = 2-Fluorophenol	15-110
NBZ = Nitrobenzene-d5	30-130
PHL = Phenol-d5	15-110
TPH = Terphenyl-d14	30-130

Client: Olin Corporation

Job Number: 360-26874-1

Surrogate Recovery Report

MAVPH Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Client Matrix: Water

Lab Sample ID	Client Sample ID	25DBT2 %Rec	25DBT1 %Rec
360-26874-8	OC-GW-16R	95	87
MB 360-55210/6		96	88
LCS 360-55210/3		99	76
LCSD 360-55210/4		97	75

Surrogate	Acceptance Limits
25DBT = 2,5-Dibromotoluene (fid)	70-130
25DBT = 2,5-Dibromotoluene (pid)	70-130

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55272

Lab Sample ID: MB 360-55272/6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1724
Date Prepared: 02/19/2010 1724

Analysis Batch: 360-55272
Prep Batch: N/A
Units: ug/L

Method: 8260B Preparation: 5030B

Instrument ID: Agilent#2 GC/MS
Lab File ID: V09963.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
2,4,4-Trimethyl-1-pentene	ND		0.81	1.0
2,4,4-Trimethyl-2-pentene	ND		0.50	1.0
Surrogate	% Rec		Acceptance Limits	
4-Bromofluorobenzene	88		70 - 130	
Dibromofluoromethane	120		70 - 130	
Toluene-d8 (Surr)	91		70 - 130	

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-55272

Method: 8260B Preparation: 5030B

LCS Lab Sample ID: LCS 360-55272/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1621
Date Prepared: 02/19/2010 1621

Analysis Batch: 360-55272
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent#2 GC/MS
Lab File ID: V09960.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 360-55272/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1642
Date Prepared: 02/19/2010 1642

Analysis Batch: 360-55272
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent#2 GC/MS
Lab File ID: V09961.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
2,4,4-Trimethyl-1-pentene	112	105	70 - 130	6	25		
2,4,4-Trimethyl-2-pentene	103	99	70 - 130	4	25		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
4-Bromofluorobenzene	105		102		70 - 130		
Dibromofluoromethane	104		102		70 - 130		
Toluene-d8 (Surr)	102		102		70 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55338

Lab Sample ID: MB 360-55338/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 03/01/2010 2250
Date Prepared: 02/23/2010 1148

Analysis Batch: 360-55513
Prep Batch: 360-55338
Units: ug/L

Method: 8270C LL Preparation: 3510C

Instrument ID: Inst. B
Lab File ID: B11388.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result	Qual	MDL	RL
Bis(2-ethylhexyl) phthalate	0.699	J	0.50	2.0
N-Nitrosodiphenylamine	ND		0.50	5.0
Surrogate	% Rec	Acceptance Limits		
2,4,6-Tribromophenol	83	15 - 110		
2-Fluorobiphenyl	77	30 - 130		
2-Fluorophenol	28	15 - 110		
Nitrobenzene-d5	90	30 - 130		
Phenol-d5	17	15 - 110		
Terphenyl-d14	87	30 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

**Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 360-55338**

**Method: 8270C LL
Preparation: 3510C**

LCS Lab Sample ID: LCS 360-55338/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 03/02/2010 0026
Date Prepared: 02/23/2010 1148

Analysis Batch: 360-55513
Prep Batch: 360-55338
Units: ug/L

Instrument ID: Inst. B
Lab File ID: B11391.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

LCSD Lab Sample ID: LCSD 360-55338/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 03/02/2010 0058
Date Prepared: 02/23/2010 1148

Analysis Batch: 360-55513
Prep Batch: 360-55338
Units: ug/L

Instrument ID: Inst. B
Lab File ID: B11392.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Bis(2-ethylhexyl) phthalate	100	94	40 - 140	6	20		
N-Nitrosodiphenylamine	72	71	40 - 140	1	20		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
2,4,6-Tribromophenol	95		98		15 - 110		
2-Fluorobiphenyl	83		79		30 - 130		
2-Fluorophenol	23		23		15 - 110		
Nitrobenzene-d5	73		73		30 - 130		
Phenol-d5	12	X	12	X	15 - 110		
Terphenyl-d14	93		80		30 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55210

Lab Sample ID: MB 360-55210/6
 Client Matrix: Water
 Dilution: 1.0
 Date Analyzed: 02/18/2010 1915
 Date Prepared: 02/18/2010 1915

Analysis Batch: 360-55210
 Prep Batch: N/A
 Units: ug/L

Method: MAVPH Preparation: 5030B

Instrument ID: Inst. G
 Lab File ID: G19918.D
 Initial Weight/Volume: 5 mL
 Final Weight/Volume: 5 mL
 Injection Volume:
 Column ID: PRIMARY

Analyte	Result	Qual	RL	RL
Benzene	ND		1.0	1.0
Ethylbenzene	ND		1.0	1.0
m-Xylene & p-Xylene	ND		2.0	2.0
Methyl tert-butyl ether	ND		1.0	1.0
Naphthalene	ND		5.0	5.0
o-Xylene	ND		1.0	1.0
Toluene	ND		1.0	1.0
C5-C8 Aliphatics (unadjusted)	ND		50	50
C9-C12 Aliphatics (unadjusted)	ND		50	50
C5-C8 Aliphatics (adjusted)	ND		50	50
C9-C12 Aliphatics (adjusted)	ND		50	50
C9-C10 Aromatics	ND		50	50
Total VPH	ND		50	50
Surrogate	% Rec	Acceptance Limits		
2,5-Dibromotoluene (fid)	96	70 - 130		
2,5-Dibromotoluene (pid)	88	70 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

**Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 360-55210**

**Method: MAVPH
Preparation: 5030B**

LCS Lab Sample ID: LCS 360-55210/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 1735
Date Prepared: 02/18/2010 1735

Analysis Batch: 360-55210
Prep Batch: N/A
Units: ug/L

Instrument ID: Inst. G
Lab File ID: G19915.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
Injection Volume:
Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 360-55210/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 1808
Date Prepared: 02/18/2010 1808

Analysis Batch: 360-55210
Prep Batch: N/A
Units: ug/L

Instrument ID: Inst. G
Lab File ID: G19916.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Benzene	99	99	70 - 130	1	25		
Ethylbenzene	99	100	70 - 130	1	25		
m-Xylene & p-Xylene	99	99	70 - 130	0	25		
Methyl tert-butyl ether	84	81	70 - 130	3	25		
Naphthalene	85	85	70 - 130	1	25		
o-Xylene	98	98	70 - 130	0	25		
Toluene	99	99	70 - 130	0	25		
C5-C8 Aliphatics (unadjusted)	100	100	70 - 130	0	25		
C9-C12 Aliphatics (unadjusted)	100	100	70 - 130	0	25		
C9-C10 Aromatics	92	92	70 - 130	0	25		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
2,5-Dibromotoluene (fid)	99		97		70 - 130		
2,5-Dibromotoluene (pid)	76		75		70 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55244

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-55244/14
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1047
Date Prepared: N/A

Analysis Batch: 360-55244
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Iron	ND		34	100
Chromium	ND		1.3	5.0

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-55244

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-55244/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1044
Date Prepared: N/A

Analysis Batch: 360-55244
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-55244/25
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1130
Date Prepared: N/A

Analysis Batch: 360-55244
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	99	91	80 - 120	9	20		
Iron	99	92	80 - 120	8	20		
Chromium	99	92	80 - 120	8	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Matrix Spike - Batch: 360-55244

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-26874-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1119
Date Prepared: N/A

Analysis Batch: 360-55244
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	ND		5000	4490	90	75 - 125	
Iron	390		5000	4770	88	75 - 125	
Chromium	3.1	J	1000	891	89	75 - 125	

Duplicate - Batch: 360-55244

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-26874-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1116
Date Prepared: N/A

Analysis Batch: 360-55244
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	ND		ND	NC	20	
Iron	390		379	3	20	
Chromium	3.1	J	2.86	9	20	J

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55231

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55231/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 2321
Date Prepared: N/A

Analysis Batch: 360-55231
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-55231

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55231/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 2336
Date Prepared: N/A

Analysis Batch: 360-55231
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.1	101	85 - 115	
Chloride	40.0	40.1	100	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-55231

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-26874-1
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 0022
Date Prepared: N/A

Analysis Batch: 360-55231
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-26874-1
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 0040
Date Prepared: N/A

Analysis Batch: 360-55231
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	106	105	75 - 125	0	20		
Chloride	112	112	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55283

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55283/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1756
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-55283

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55283/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1811
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.9	104	85 - 115	
Chloride	40.0	40.4	101	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55290

Lab Sample ID: MB 360-55290/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/22/2010 1128
Date Prepared: 02/22/2010 0913

Analysis Batch: 360-55296
Prep Batch: 360-55290
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-55290

Lab Sample ID: LCS 360-55290/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/22/2010 1129
Date Prepared: 02/22/2010 0913

Analysis Batch: 360-55296
Prep Batch: 360-55290
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.72	97	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Method Blank - Batch: 360-55177

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-55177/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 0950
Date Prepared: N/A

Analysis Batch: 360-55177
Prep Batch: N/A
Units: umhos/cm

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-55177

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-55177/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 0930
Date Prepared: N/A

Analysis Batch: 360-55177
Prep Batch: N/A
Units: umhos/cm

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1390	98	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26874-1

Lab Control Sample - Batch: 360-55179

Method: SM 4500 H+ B
Preparation: N/A

Lab Sample ID: LCS 360-55179/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/18/2010 0940
Date Prepared: N/A

Analysis Batch: 360-55179
Prep Batch: N/A
Units: SU

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	6.00	5.920	99	90 - 110	

Calculations are performed before rounding to avoid round-off errors in calculated results.

VPH SAMPLE INFORMATION DATA

SAMPLE INFORMATION

Sample ID: **26874-8**

Batch# **55210**

Matrix	<input checked="" type="checkbox"/> Aqueous	<input type="checkbox"/> Soil	<input type="checkbox"/> Sediment	<input type="checkbox"/> Other
Containers	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Broken	<input type="checkbox"/> Leaking:	
Sample Preservatives	Aqueous (acid Preserved)	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> pH<2	<input type="checkbox"/> pH>2 Comment:
	Aqueous (TSP Preserved)	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> pH<11	<input type="checkbox"/> pH>11 Comment:
	Soil or Sediment	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Samples NOT preserved in Methanol or air-tight container	
		<input type="checkbox"/> Samples rec'd in Methanol: <input type="checkbox"/> covering soil/sediment <input type="checkbox"/> not covering soil/sediment	<input type="checkbox"/> 1:1 +/-25%	
	<input type="checkbox"/> Samples received in air-tight container:			<input type="checkbox"/> Other:
Temperature	<input checked="" type="checkbox"/> Received on Ice	<input type="checkbox"/> Received at 4°C ± 2°C	<input checked="" type="checkbox"/> Other:	1.6 & 0.6°C



MADEP MA 014
RIDOH57
CTDPH 0494
VT DECWSD
NH DES 253903-A

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NYDOH 10843



TestAmerica Westfield
53 Southampton Rd.
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

State Accreditation Matrix

Method Name	Description	State where Primary Accreditation is Carried				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-26874-1

Login Number: 26874

List Source: TestAmerica Westfield

Creator: Knollmeyer, Tim D

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.6/0.6 C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

TestAmerica Laboratories, Inc.

Chain of Custody Form

TestAmerica

•53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

Client: <u>Olin Chemical/MACTEC</u>		Project #: <u>6107-09-0016.04</u>		Job# <u>360-26874</u>	Quote#	PO#																						
Address: <u>51 Eames Street</u> <u>Wilmington, MA 01887</u>		Project Manager: <u>P. Thompson</u>		Shaded areas for office use Analysis Requested Check analysis and specify method and analytes in comments section. For example: 500-series for drinking water 600-series for waste water 8000-series for haz/solid waste Use comments section to further define.																								
Phone: Fax:		Work ID: <u>Groundwater</u>																										
Requested Turn Around Time		Regulatory Classification / Special Report Format		Comments (Special Instructions) MCP case narrative Dissolved metals are field filtered. Analysis-- Ammonia Nitrogen--Lac 107-06-1B Chloride/sulfate--EPA 300 Specific Conductivity--SM 2510B Time change per Dave Chapman per 2/17/10																								
10 Business Day (Std) <u>XX</u>	Rush TAT Requested:	NPDES _____ Drinking Water _____ DEP Form(s) _____																										
15 Business Day _____	24 hrs _____ 72 hrs _____	RCRA _____ MCP GW1/S1 _____ MWRA Smart Rpt _____																										
Other _____	48 hrs _____ 5 Day _____	Other _____ MCP QA/QC Rpt <u>XX</u>																										
Sample Type Codes WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other		Preservative NaHSO4/MeOH HNO3 to pH <2 H2SO4 to pH <2 HCl to pH <2 NaOH to pH >12 NaOH/ZNAC None / 4° C Ammonia-Nitrogen Chloride, Sulfate Specific Conductivity Diss. Al/Cr by 6010B Groundwater metals 8260B TMP's only 8270C NDPA/BEHP VPH (MAV/PH) Dissolved Fe by 6010B pH by SM4500H+B Other Other Other																										
Sample ID	Sample Type	Sampler's Initials	Date Time Collected	Grab	Comp.	# Containers	Plastic(P) or Glass(G)	NaHSO4/MeOH	HNO3 to pH <2	H2SO4 to pH <2	HCl to pH <2	NaOH to pH >12	NaOH/ZNAC	None / 4° C	Ammonia-Nitrogen	Chloride, Sulfate	Specific Conductivity	Diss. Al/Cr by 6010B	Groundwater metals	8260B TMP's only	8270C NDPA/BEHP	VPH (MAV/PH)	Dissolved Fe by 6010B	pH by SM4500H+B	Other	Other	Other	
OC-PZ-17RR	GW	MAM	2-15-10 14:20	X		3	P		1	1				1	X	X	X	X										
OC-GW-25	GW	DLC	2-15-10 14:35	X		3	P		1	1				1	X	X	X	X										
OC-GW-2025	GW	MAM	2-17-10 9:40	X		3	P		1	1				1	X	X	X	X										
OC-GW-2025-DUP	GW	MAM	2-17-10 9:40	X		3	P		1	1				1	X	X	X	X										
OC-GW-202D	GW	DLC	2-17-10 10:00	X		3	P		1	1				1	X	X	X	X										
OC-GW-795	GW	DLC	2-17-10 11:20	X		3	P		1	1				1	X	X	X	X										
OC-GW-785	GW	MAM	2-17-10 11:25	X		3	P		1	1				1	X	X	X	X										
OC-GW-16R	GW	MAM	2-17-10 13:55	X		12	P		1	1	7			3	X					X	X	X	X	X				
Sampled by (print): <u>David Chapman / Mark Maggione</u>				Signature: <u>[Signature]</u>																								
Relinquished by: <u>David Chapman</u>				Date: <u>2/17/10</u> Time: <u>14:40</u>				Received by: <u>[Signature]</u>				Date: <u>2-17-10</u> Time: <u>1440</u>				Cooler? <u>(Y)</u> N Samples Iced? <u>(Y)</u> N												
Relinquished by: <u>[Signature]</u>				Date: <u>2/17/10</u> Time: <u>1640</u>				Received by: <u>[Signature]</u>				Date: <u>2-17-10</u> Time: <u>1640</u>				Temp @ receipt: <u>1.6°/0.6° C</u>												
Method of shipment:				TestAmerica-Westfield																								
				By: <u>IDL</u> Date: <u>2-17-10</u>																								

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
SEMI-VOLATILE ORGAINICS BY METHOD 8270C/625

attach to this review.

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☒ No ☐ N/A ☐ Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

*low level detection of bis(2-ethylhexyl) phthalate
was qualified ND due to blank contamination*

REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.

STL-Westfield, 2002. "Olin – General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff, Office of Environmental Measurement and Evaluation; December 1996

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements)," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Tiger Cunningham 6/22/10
 Sr. Review/Date Chris Riccardi 6/25/10
 Lab Report # 360-20874-1
 Project # 6107100016-12

Dissolved Al & Cr only

OC-PZ-17RR OC-GW-202SDVP
 OC-GW-25 OC-GW-2020
 OC-GW-202S OC-GW-799

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report?
 Check items received.

Yes ☒ No ☐ N/A ☐ Comments: OC-GW-785

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (*Cooler Receipt Form present?*):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|--|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input checked="" type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable | | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

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☒ Method blank results ☒ LCS recoveries ☐ MS/MSD recoveries and RPDs *Not Submitted* ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☒ SOW ☐ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

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ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

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If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

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6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked. Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? Yes ☒ No ☐ N/A ☒ ^{TC} Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule? Yes ☐ No ☐ N/A ☒ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits? Yes ☐ No ☒ N/A ☒ ^{TC} Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
 SR = Sample result
 SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

Not Requested
 on the COC. MS wa
 analyzed by the lab as
 batch QC.
 Sample
 OC-PZ-17RR

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NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$

Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 **Laboratory Duplicate**

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

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MADEP Laboratory Duplicate Sample RPD Criteria:

For aqueous results $> 5 \times RL$, RPD must be $\pm 20\%$

For aqueous results $< 5 \times RL$, RPD must be $\leq RL$

For soil/sediment results $> 5 \times RL$, RPD must be $\pm 35\%$

For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$

QAPP RPD

20

20

20

20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒

No ☐

N/A ☐

Comments:

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9.2 Were field duplicates collected per the required frequency?

Yes ☒ No ☐ N/A ☐ Comments:

SOW ☒ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD for all results and attach to this review. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: RPD must be \leq 50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If results for both total and dissolved are \geq 5x the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

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10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

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LEVEL I DATA QUALITY EVALUATION
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WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

Reviewer/Date Tige Cunningham / 6/22/10
Sr. Review/Date Chrs Riccardi 6/25/10
Lab Report # TAL-Westfield 360-20874-1
Project # 0107100016-12

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

• OC-PZ-17RR • OC-GW-202D
• OC-GW-25 • OC-GW-79S
• OC-GW-202S • DVP • OC-GW-78S

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed?

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|--|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input checked="" type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable | | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Method blank results ☒ LCS recoveries ☐ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Yes ☐ No ☒ N/A ☐ Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

Yes ☒ No ☐ N/A ☐ Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☒ QAPP/IRSWP ☐ Lab?

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/ L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond.** <input checked="" type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? Yes ☒ No ☐ N/A ☐ Comments:

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).

Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits?

Yes ☐ No ☒ N/A ☐ Comments:

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LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments: Not Requested on COC but analyzed
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments: for sulfate & chloride
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments: on sample DC-P2-17RR
↳ only for chloride & sulfate			
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Comments:

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NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

SA = Spike added

Where: SSR = Spiked sample result
 SR = Sample result

MS/MSD Recovery Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) <input type="checkbox"/> = 75-125%
Chloride*(SM 4500 Cl) <input checked="" type="checkbox"/> = 75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* <input type="checkbox"/> = 75-125%	COD High* <input type="checkbox"/> = 75-125%	Nitrate Nitrogen as N** <input type="checkbox"/> = 75-125%
Nitrite Nitrogen as N** <input type="checkbox"/> = 75-125%	Hardness* <input type="checkbox"/> = 75-125%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 75-125%	pH* = NA TSS* = NA
Other parameter(list) _____ % R = _____ <input type="checkbox"/> Rec Limits = _____			

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where S = MS result
 D = MSD result

Yes ☐ No ☒ N/A ☐ Comments:

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes ☐ No ☐ N/A ☒ Comments:

not analyzed

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity *☐ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒

No ☐

N/A ☐

Comments: OC-GW-2025
OC-GW-2025-DUP

9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

QAPP/IRSWP ☐ MADEP Option 1(1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

ANALYTICAL REPORT

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:

Chiml 6-29-10

Job Number: 360-26898-1

Job Description: Quarterly Surfacewater

For:

Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

Joseph A. Chiml

Approved for release.
Joe Chiml
Report Production Representative
2/26/10 12:34 PM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
02/26/2010

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085
Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-26898-1																
Project Location: MADEP RTN¹:																	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-26898-(1-8)																	
Sample Matrices:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Groundwater</td> <td style="width: 15%;">Soil/Sediment</td> <td style="width: 15%;">Drinking Water</td> <td style="width: 15%;">Other:</td> </tr> <tr> <td>MCP SW-846</td> <td>8260B ()</td> <td>8151A ()</td> <td>8330 ()</td> </tr> <tr> <td>Methods Used</td> <td>8270C ()</td> <td>8081A ()</td> <td>VPH ()</td> </tr> <tr> <td>As specified in MADEP Compendium of Analytical Methods. (check all that apply)</td> <td>8082 ()</td> <td>8021B ()</td> <td>EPH ()</td> </tr> </table>	Groundwater	Soil/Sediment	Drinking Water	Other:	MCP SW-846	8260B ()	8151A ()	8330 ()	Methods Used	8270C ()	8081A ()	VPH ()	As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()
Groundwater	Soil/Sediment	Drinking Water	Other:														
MCP SW-846	8260B ()	8151A ()	8330 ()														
Methods Used	8270C ()	8081A ()	VPH ()														
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()														
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.																	

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 2/26/10 12:28

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-26898-1**

Project Location: MADEP RTN¹:

This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)]
360-26898-(1-8)

Sample Matrices:	Groundwater	Soil/Sediment		Drinking Water	Other:	
MCP SW-846	8260B ()	8151A ()	8330 ()	6010B ()	7470A/1A ()	Other (x)
Methods Used	8270C ()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()	
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()	
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.						

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 2/26/10 12:28

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
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NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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CASE NARRATIVE

Client: Olin Corporation

Project: Quarterly Surfacewater

Report Number: 360-26898-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 02/18/2010; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2 C of the required temperature or method specified range. For samples with a specified temperature of 4 C, samples with a temperature ranging from just above freezing temperature of water to 6 C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

TOTAL METALS

Samples 360-26898-1 through 360-26898-8 were analyzed for total metals in accordance with EPA SW-846 Method 6010B. The samples were prepared and analyzed on 02/19/2010.

Chromium was detected in method blank MB 360-55194/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the metals analyses.

All other quality control parameters were within the acceptance limits.

DISSOLVED METALS

Samples 360-26898-1 through 360-26898-8 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 02/19/2010.

The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

ANIONS

Samples 360-26898-1 through 360-26898-8 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 02/19/2010.

Samples 360-26898-1 through 360-26898-8(10X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples 360-26898-1 through 360-26898-8 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 02/25/2010.

Samples 360-26898-2 through 360-26898-4(10X), 360-26898-5 and 360-26898-6(5X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTANCE

Samples 360-26898-1 through 360-26898-8 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 02/19/2010.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-26898-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-26898-1	OC-SW-ISCO-3-0.2				
Aluminum		91 J	100	ug/L	6010B
Sodium		77000	2000	ug/L	6010B
Sulfate		46	2.0	mg/L	300.0
Nitrate as N		1.2	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		3.1	0.10	mg/L	L107-06-1B
Specific Conductance		700	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Sodium		81000	2000	ug/L	6010B
360-26898-2	OC-SW-ISCO-2-0.2				
Aluminum		3900	100	ug/L	6010B
Chromium		810 B	5.0	ug/L	6010B
Sodium		160000	2000	ug/L	6010B
Sulfate		450	20	mg/L	300.0
Nitrate as N		0.94	0.050	mg/L	300.0
Chloride		220	10	mg/L	300.0
Ammonia		72	1.0	mg/L	L107-06-1B
Specific Conductance		1700	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		510	100	ug/L	6010B
Chromium		170	5.0	ug/L	6010B
Sodium		170000	2000	ug/L	6010B
360-26898-3	OC-SW-PZ-16RR-0.2				
Aluminum		5300	100	ug/L	6010B
Chromium		1200 B	5.0	ug/L	6010B
Sodium		160000	2000	ug/L	6010B
Sulfate		320	20	mg/L	300.0
Nitrate as N		2.4	0.050	mg/L	300.0
Chloride		240	10	mg/L	300.0
Ammonia		40	1.0	mg/L	L107-06-1B
Specific Conductance		1500	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		220	100	ug/L	6010B
Chromium		130	5.0	ug/L	6010B
Sodium		160000	2000	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-26898-1

Lab Sample ID	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
Analyte						
360-26898-4	OC-SW-PZ-16RR-0.2-DUP					
Aluminum		4800		100	ug/L	6010B
Chromium		1100	B	5.0	ug/L	6010B
Sodium		160000		2000	ug/L	6010B
Sulfate		310		20	mg/L	300.0
Nitrate as N		2.4		0.050	mg/L	300.0
Chloride		240		10	mg/L	300.0
Ammonia		43		1.0	mg/L	L107-06-1B
Specific Conductance		1500		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		210		100	ug/L	6010B
Chromium		120		5.0	ug/L	6010B
Sodium		160000		2000	ug/L	6010B
360-26898-5	OC-SW-PZ-17RR-0.2					
Aluminum		2600		100	ug/L	6010B
Chromium		630	B	5.0	ug/L	6010B
Sodium		140000		2000	ug/L	6010B
Sulfate		210		20	mg/L	300.0
Nitrate as N		3.3		0.050	mg/L	300.0
Chloride		230		10	mg/L	300.0
Ammonia		33		0.50	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		130		100	ug/L	6010B
Chromium		83		5.0	ug/L	6010B
Sodium		150000		2000	ug/L	6010B
360-26898-6	OC-SW-SD-17-0.2					
Aluminum		4600		100	ug/L	6010B
Chromium		840	B	5.0	ug/L	6010B
Sodium		130000		2000	ug/L	6010B
Sulfate		200		20	mg/L	300.0
Nitrate as N		3.6		0.050	mg/L	300.0
Chloride		240		10	mg/L	300.0
Ammonia		48		0.50	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		150		100	ug/L	6010B
Chromium		60		5.0	ug/L	6010B
Sodium		150000		2000	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-26898-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-26898-7	OC-SW-PZ-18R-0.2				
Aluminum		140	100	ug/L	6010B
Chromium		22 B	5.0	ug/L	6010B
Sodium		120000	2000	ug/L	6010B
Sulfate		86	2.0	mg/L	300.0
Nitrate as N		0.69	0.050	mg/L	300.0
Chloride		220	10	mg/L	300.0
Ammonia		16	0.10	mg/L	L107-06-1B
Specific Conductance		950	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		120	100	ug/L	6010B
Chromium		20	5.0	ug/L	6010B
Sodium		130000	2000	ug/L	6010B
360-26898-8	OC-SW-ISCO-1-0.2				
Aluminum		130	100	ug/L	6010B
Chromium		20 B	5.0	ug/L	6010B
Sodium		110000	2000	ug/L	6010B
Sulfate		80	2.0	mg/L	300.0
Nitrate as N		0.76	0.050	mg/L	300.0
Chloride		220	10	mg/L	300.0
Ammonia		14	0.10	mg/L	L107-06-1B
Specific Conductance		940	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		110	100	ug/L	6010B
Chromium		19	5.0	ug/L	6010B
Sodium		130000	2000	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-26898-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Total Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Preparation, Total Metals	TAL WFD		SW846 3010A
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-26898-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-26898-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-26898-1	OC-SW-ISCO-3-0.2	Water	02/18/2010 0845	02/18/2010 1655
360-26898-2	OC-SW-ISCO-2-0.2	Water	02/18/2010 0900	02/18/2010 1655
360-26898-3	OC-SW-PZ-16RR-0.2	Water	02/18/2010 0930	02/18/2010 1655
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	Water	02/18/2010 0930	02/18/2010 1655
360-26898-5	OC-SW-PZ-17RR-0.2	Water	02/18/2010 0950	02/18/2010 1655
360-26898-6	OC-SW-SD-17-0.2	Water	02/18/2010 1000	02/18/2010 1655
360-26898-7	OC-SW-PZ-18R-0.2	Water	02/18/2010 1035	02/18/2010 1655
360-26898-8	OC-SW-ISCO-1-0.2	Water	02/18/2010 1045	02/18/2010 1655

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-3-0.2
Lab Sample ID: 360-26898-1

Date Sampled: 02/18/2010 0845
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	02/19/2010 1415	
Aluminum	ND	ug/L	39	100	1.0
Chromium	ND	ug/L	1.3	5.0	1.0
Sodium	81000	ug/L	250	2000	1.0
Method: 6010B			Date Analyzed:	02/19/2010 1550	
Prep Method: 3010A			Date Prepared:	02/19/2010 0735	
Aluminum	91 J	ug/L	39	100	1.0
Chromium	ND	ug/L	1.3	5.0	1.0
Sodium	77000	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-3-0.2
Lab Sample ID: 360-26898-1

Date Sampled: 02/18/2010 0845
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	02/19/2010 1655		
Sulfate	46	mg/L	2.0	2.0	1.0
Nitrate as N	1.2	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed:	02/19/2010 1710		
Chloride	160	mg/L	10	10	10
Method: L107-06-1B					
		Date Analyzed:	02/25/2010 1534		
Prep Method: Distill/Ammonia		Date Prepared:	02/25/2010 1105		
Ammonia	3.1	mg/L	0.10	0.10	1.0
Method: SM 2510B					
		Date Analyzed:	02/19/2010 1013		
Specific Conductance	700	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-2-0.2
Lab Sample ID: 360-26898-2

Date Sampled: 02/18/2010 0900
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1426			
Aluminum	510	ug/L	39	100	1.0
Chromium	170	ug/L	1.3	5.0	1.0
Sodium	170000	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1605			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	3900	ug/L	39	100	1.0
Chromium	810	ug/L	1.3	5.0	1.0
Sodium	160000	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-2-0.2
Lab Sample ID: 360-26898-2

Date Sampled: 02/18/2010 0900
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed: 02/19/2010 1828			
Nitrate as N	0.94	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed: 02/19/2010 1844			
Sulfate	450	mg/L	20	20	10
Chloride	220	mg/L	10	10	10
Method: L107-06-1B					
		Date Analyzed: 02/25/2010 1536			
Prep Method: Distill/Ammonia		Date Prepared: 02/25/2010 1105			
Ammonia	72	mg/L	1.0	1.0	10
Method: SM 2510B					
		Date Analyzed: 02/19/2010 1000			
Specific Conductance	1700	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-16RR-0.2
Lab Sample ID: 360-26898-3

Date Sampled: 02/18/2010 0930
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1435			
Aluminum	220	ug/L	39	100	1.0
Chromium	130	ug/L	1.3	5.0	1.0
Sodium	160000	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1608			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	5300	ug/L	39	100	1.0
Chromium	1200	ug/L	1.3	5.0	1.0
Sodium	160000	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-16RR-0.2
Lab Sample ID: 360-26898-3

Date Sampled: 02/18/2010 0930
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	02/19/2010 1930		
Nitrate as N	2.4	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed:	02/19/2010 1945		
Sulfate	320	mg/L	20	20	10
Chloride	240	mg/L	10	10	10
Method: L107-06-1B					
		Date Analyzed:	02/25/2010 1537		
Prep Method: Distill/Ammonia		Date Prepared:	02/25/2010 1105		
Ammonia	40	mg/L	1.0	1.0	10
Method: SM 2510B					
		Date Analyzed:	02/19/2010 1002		
Specific Conductance	1500	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-16RR-0.2-DUP
Lab Sample ID: 360-26898-4

Date Sampled: 02/18/2010 0930
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1438			
Aluminum	210	ug/L	39	100	1.0
Chromium	120	ug/L	1.3	5.0	1.0
Sodium	160000	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1611			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	4800	ug/L	39	100	1.0
Chromium	1100	ug/L	1.3	5.0	1.0
Sodium	160000	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-16RR-0.2-DUP
Lab Sample ID: 360-26898-4

Date Sampled: 02/18/2010 0930
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	02/19/2010 2000	
Nitrate as N	2.4	mg/L	0.050	0.050	1.0
Method: 300.0			Date Analyzed:	02/19/2010 2015	
Sulfate	310	mg/L	20	20	10
Chloride	240	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B			Date Analyzed:	02/25/2010 1540	
Prep Method: Distill/Ammonia			Date Prepared:	02/25/2010 1105	
Ammonia	43	mg/L	1.0	1.0	10
Method: SM 2510B			Date Analyzed:	02/19/2010 1003	
Specific Conductance	1500	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-17RR-0.2
Lab Sample ID: 360-26898-5

Date Sampled: 02/18/2010 0950
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1441			
Aluminum	130	ug/L	39	100	1.0
Chromium	83	ug/L	1.3	5.0	1.0
Sodium	150000	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1619			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	2600	ug/L	39	100	1.0
Chromium	630	ug/L	1.3	5.0	1.0
Sodium	140000	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-17RR-0.2
Lab Sample ID: 360-26898-5

Date Sampled: 02/18/2010 0950
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed: 02/19/2010 2028		
Nitrate as N	3.3	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0			Date Analyzed: 02/19/2010 2043		
Sulfate	210	mg/L	20	20	10
Chloride	230	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed: 02/25/2010 1541		
Prep Method: Distill/Ammonia			Date Prepared: 02/25/2010 1105		
Ammonia	33	mg/L	0.50	0.50	5.0
Method: SM 2510B			Date Analyzed: 02/19/2010 1005		
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-SD-17-0.2
Lab Sample ID: 360-26898-6

Date Sampled: 02/18/2010 1000
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1444			
Aluminum	150	ug/L	39	100	1.0
Chromium	60	ug/L	1.3	5.0	1.0
Sodium	150000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1622			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	4600	ug/L	39	100	1.0
Chromium	840	ug/L	1.3	5.0	1.0
Sodium	130000 B J	ug/L	250	2000	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-SD-17-0.2
Lab Sample ID: 360-26898-6

Date Sampled: 02/18/2010 1000
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed: 02/19/2010 2128		
Nitrate as N	3.6	mg/L	0.050	0.050	1.0
Method: 300.0			Date Analyzed: 02/19/2010 2143		
Sulfate	200	mg/L	20	20	10
Chloride	240	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B			Date Analyzed: 02/25/2010 1542		
Prep Method: Distill/Ammonia			Date Prepared: 02/25/2010 1105		
Ammonia	48	mg/L	0.50	0.50	5.0
Method: SM 2510B			Date Analyzed: 02/19/2010 1006		
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-18R-0.2
Lab Sample ID: 360-26898-7

Date Sampled: 02/18/2010 1035
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B					
			Date Analyzed:	02/19/2010 1447	
Aluminum	120	ug/L	39	100	1.0
Chromium	20	ug/L	1.3	5.0	1.0
Sodium	130000	ug/L	250	2000	1.0
Method: 6010B					
			Date Analyzed:	02/19/2010 1625	
Prep Method: 3010A			Date Prepared:	02/19/2010 0735	
Aluminum	140	ug/L	39	100	1.0
Chromium	22	ug/L	1.3	5.0	1.0
Sodium	120000	ug/L	250	2000	1.0

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6/22/10

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Job Number: 360-26898-1

Client Sample ID: OC-SW-PZ-18R-0.2
Lab Sample ID: 360-26898-7

Date Sampled: 02/18/2010 1035
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	02/19/2010 2159		
Sulfate	86	mg/L	2.0	2.0	1.0
Nitrate as N	0.69	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed:	02/19/2010 2214		
Chloride	220	mg/L	10	10	10
Method: L107-06-1B					
		Date Analyzed:	02/25/2010 1533		
Prep Method: Distill/Ammonia		Date Prepared:	02/25/2010 1105		
Ammonia	16	mg/L	0.10	0.10	1.0
Method: SM 2510B					
		Date Analyzed:	02/19/2010 1008		
Specific Conductance	950	umhos/cm	1.0	1.0	1.0

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6/22/10

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Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-1-0.2
Lab Sample ID: 360-26898-8

Date Sampled: 02/18/2010 1045
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 02/19/2010 1449			
Aluminum	110	ug/L	39	100	1.0
Chromium	19	ug/L	1.3	5.0	1.0
Sodium	130000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 02/19/2010 1628			
Prep Method: 3010A		Date Prepared: 02/19/2010 0735			
Aluminum	130	ug/L	39	100	1.0
Chromium	20	ug/L	1.3	5.0	1.0
Sodium	110000 J	ug/L	250	2000	1.0

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6/22/10

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Job Number: 360-26898-1

Client Sample ID: OC-SW-ISCO-1-0.2
Lab Sample ID: 360-26898-8

Date Sampled: 02/18/2010 1045
Date Received: 02/18/2010 1655
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed: 02/19/2010 2229		
Sulfate	80	mg/L	2.0	2.0	1.0
Nitrate as N	0.76	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0			Date Analyzed: 02/19/2010 2244		
Chloride	220	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed: 02/25/2010 1534		
Prep Method: Distill/Ammonia			Date Prepared: 02/25/2010 1105		
Ammonia	14	mg/L	0.10	0.10	1.0
Method: SM 2510B			Date Analyzed: 02/19/2010 1009		
Specific Conductance	940	umhos/cm	1.0	1.0	1.0

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DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-26898-1

Lab Section	Qualifier	Description
Metals		
	B	Compound was found in the blank and sample.
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-55194					
LCS 360-55194/2-A	Lab Control Sample	T	Water	3010A	
LCSD 360-55194/3-A	Lab Control Sample Duplicate	T	Water	3010A	
MB 360-55194/1-A	Method Blank	T	Water	3010A	
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	3010A	
360-26898-1DU	Duplicate	T	Water	3010A	
360-26898-1MS	Matrix Spike	T	Water	3010A	
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	3010A	
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	3010A	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	3010A	
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	3010A	
360-26898-6	OC-SW-SD-17-0.2	T	Water	3010A	
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	3010A	
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	3010A	
Analysis Batch:360-55248					
LCS 360-55248/1	Lab Control Sample	T	Water	6010B	
LCSD 360-55248/8	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-55248/2	Method Blank	T	Water	6010B	
360-26898-1	OC-SW-ISCO-3-0.2	D	Water	6010B	
360-26898-1DU	Duplicate	D	Water	6010B	
360-26898-1MS	Matrix Spike	D	Water	6010B	
360-26898-2	OC-SW-ISCO-2-0.2	D	Water	6010B	
360-26898-3	OC-SW-PZ-16RR-0.2	D	Water	6010B	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	D	Water	6010B	
360-26898-5	OC-SW-PZ-17RR-0.2	D	Water	6010B	
360-26898-6	OC-SW-SD-17-0.2	D	Water	6010B	
360-26898-7	OC-SW-PZ-18R-0.2	D	Water	6010B	
360-26898-8	OC-SW-ISCO-1-0.2	D	Water	6010B	
Analysis Batch:360-55263					
LCS 360-55194/2-A	Lab Control Sample	T	Water	6010B	360-55194
LCSD 360-55194/3-A	Lab Control Sample Duplicate	T	Water	6010B	360-55194
MB 360-55194/1-A	Method Blank	T	Water	6010B	360-55194
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	6010B	360-55194
360-26898-1DU	Duplicate	T	Water	6010B	360-55194
360-26898-1MS	Matrix Spike	T	Water	6010B	360-55194
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	6010B	360-55194
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	6010B	360-55194
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	6010B	360-55194
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	6010B	360-55194
360-26898-6	OC-SW-SD-17-0.2	T	Water	6010B	360-55194
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	6010B	360-55194
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	6010B	360-55194

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
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Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-55220					
LCS 360-55220/1	Lab Control Sample	T	Water	SM 2510B	
MB 360-55220/18	Method Blank	T	Water	SM 2510B	
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	SM 2510B	
360-26898-1DU	Duplicate	T	Water	SM 2510B	
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	SM 2510B	
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	SM 2510B	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	SM 2510B	
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	SM 2510B	
360-26898-6	OC-SW-SD-17-0.2	T	Water	SM 2510B	
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	SM 2510B	
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	SM 2510B	
Analysis Batch:360-55279					
LCS 360-55279/4	Lab Control Sample	T	Water	300.0	
MB 360-55279/3	Method Blank	T	Water	300.0	
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	300.0	
Analysis Batch:360-55281					
LCS 360-55281/4	Lab Control Sample	T	Water	300.0	
MB 360-55281/3	Method Blank	T	Water	300.0	
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	300.0	
360-26898-2MS	Matrix Spike	T	Water	300.0	
360-26898-2MSD	Matrix Spike Duplicate	T	Water	300.0	
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	300.0	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	300.0	
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	300.0	
360-26898-6	OC-SW-SD-17-0.2	T	Water	300.0	
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	300.0	
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	300.0	
Analysis Batch:360-55282					
LCS 360-55282/4	Lab Control Sample	T	Water	300.0	
MB 360-55282/3	Method Blank	T	Water	300.0	
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	300.0	

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-55283					
LCS 360-55283/4	Lab Control Sample	T	Water	300.0	
MB 360-55283/3	Method Blank	T	Water	300.0	
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	300.0	
360-26898-2MS	Matrix Spike	T	Water	300.0	
360-26898-2MSD	Matrix Spike Duplicate	T	Water	300.0	
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	300.0	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	300.0	
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	300.0	
360-26898-6	OC-SW-SD-17-0.2	T	Water	300.0	
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	300.0	
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	300.0	
Prep Batch: 360-55414					
LCS 360-55414/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-55414/1-A	Method Blank	T	Water	Distill/Ammonia	
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	Distill/Ammonia	
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	Distill/Ammonia	
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	Distill/Ammonia	
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	Distill/Ammonia	
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	Distill/Ammonia	
360-26898-6	OC-SW-SD-17-0.2	T	Water	Distill/Ammonia	
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	Distill/Ammonia	
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	Distill/Ammonia	
Analysis Batch:360-55427					
LCS 360-55414/2-A	Lab Control Sample	T	Water	L107-06-1B	360-55414
MB 360-55414/1-A	Method Blank	T	Water	L107-06-1B	360-55414
360-26898-1	OC-SW-ISCO-3-0.2	T	Water	L107-06-1B	360-55414
360-26898-2	OC-SW-ISCO-2-0.2	T	Water	L107-06-1B	360-55414
360-26898-3	OC-SW-PZ-16RR-0.2	T	Water	L107-06-1B	360-55414
360-26898-4	OC-SW-PZ-16RR-0.2-DUP	T	Water	L107-06-1B	360-55414
360-26898-5	OC-SW-PZ-17RR-0.2	T	Water	L107-06-1B	360-55414
360-26898-6	OC-SW-SD-17-0.2	T	Water	L107-06-1B	360-55414
360-26898-7	OC-SW-PZ-18R-0.2	T	Water	L107-06-1B	360-55414
360-26898-8	OC-SW-ISCO-1-0.2	T	Water	L107-06-1B	360-55414

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55194

Lab Sample ID: MB 360-55194/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1536
Date Prepared: 02/19/2010 0735

Analysis Batch: 360-55263
Prep Batch: 360-55194
Units: ug/L

*Total
Fraction
Batch*

Method: 6010B
Preparation: 3010A

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Chromium	1.60	J	1.3	5.0
Sodium	ND		250	2000

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-55194

Method: 6010B
Preparation: 3010A

LCS Lab Sample ID: LCS 360-55194/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1545
Date Prepared: 02/19/2010 0735

Analysis Batch: 360-55263
Prep Batch: 360-55194
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 360-55194/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1548
Date Prepared: 02/19/2010 0735

Analysis Batch: 360-55263
Prep Batch: 360-55194
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	103	105	80 - 120	2	20		
Chromium	102	105	80 - 120	3	20		
Sodium	101	103	80 - 120	2	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Matrix Spike - Batch: 360-55194

Method: 6010B
Preparation: 3010A

Lab Sample ID: 360-26898-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1556
Date Prepared: 02/19/2010 0735

Analysis Batch: 360-55263
Prep Batch: 360-55194
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	91	J	5000	5390	106	75 - 125	
Chromium	ND		1000	1050	105	75 - 125	
Sodium	77000		20000	97200	99	75 - 125	

Duplicate - Batch: 360-55194

Method: 6010B
Preparation: 3010A

Lab Sample ID: 360-26898-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1553
Date Prepared: 02/19/2010 0735

Analysis Batch: 360-55263
Prep Batch: 360-55194
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	91	J	92.3	2	20	J
Chromium	ND		ND	NC	20	
Sodium	77000		78000	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55248

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-55248/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1357
Date Prepared: N/A

Analysis Batch: 360-55248
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Chromium	ND		1.3	5.0
Sodium	ND		250	2000

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-55248

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-55248/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1353
Date Prepared: N/A

Analysis Batch: 360-55248
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-55248/8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1429
Date Prepared: N/A

Analysis Batch: 360-55248
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	100	97	80 - 120	3	20		
Chromium	99	97	80 - 120	3	20		
Sodium	100	97	80 - 120	3	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Matrix Spike - Batch: 360-55248

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-26898-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1421
Date Prepared: N/A

Analysis Batch: 360-55248
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	ND	5000	5170	103	75 - 125	
Chromium	ND	1000	998	100	75 - 125	
Sodium	81000	20000	97400	82	75 - 125	4

Duplicate - Batch: 360-55248

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-26898-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1418
Date Prepared: N/A

Analysis Batch: 360-55248
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	ND	ND	NC	20	
Chromium	ND	ND	NC	20	
Sodium	81000	81000	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55279

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55279/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1122
Date Prepared: N/A

Analysis Batch: 360-55279
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Nitrate as N	ND		0.050	0.050
Nitrite as N	ND		0.010	0.010

Lab Control Sample - Batch: 360-55279

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55279/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1137
Date Prepared: N/A

Analysis Batch: 360-55279
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.09	102	85 - 115	
Nitrite as N	4.00	4.05	101	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55281

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55281/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1756
Date Prepared: N/A

Analysis Batch: 360-55281
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Nitrate as N	ND		0.050	0.050
Nitrite as N	ND		0.010	0.010

Lab Control Sample - Batch: 360-55281

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55281/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1811
Date Prepared: N/A

Analysis Batch: 360-55281
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.19	105	85 - 115	
Nitrite as N	4.00	4.02	100	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-55281

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-26898-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 1859
Date Prepared: N/A

Analysis Batch: 360-55281
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-26898-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 1915
Date Prepared: N/A

Analysis Batch: 360-55281
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Nitrate as N	113	114	75 - 125	1	20		
Nitrite as N	99	99	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55282

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55282/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1122
Date Prepared: N/A

Analysis Batch: 360-55282
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-55282

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55282/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1137
Date Prepared: N/A

Analysis Batch: 360-55282
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.3	103	85 - 115	
Chloride	40.0	40.1	100	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55283

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-55283/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1756
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-55283

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-55283/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1811
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.9	104	85 - 115	
Chloride	40.0	40.4	101	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-55283

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-26898-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 1859
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-26898-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 02/19/2010 1915
Date Prepared: N/A

Analysis Batch: 360-55283
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	99	99	75 - 125	0	20		
Chloride	98	98	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55414

Lab Sample ID: MB 360-55414/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/25/2010 1517
Date Prepared: 02/25/2010 1105

Analysis Batch: 360-55427
Prep Batch: 360-55414
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-55414

Lab Sample ID: LCS 360-55414/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/25/2010 1518
Date Prepared: 02/25/2010 1105

Analysis Batch: 360-55427
Prep Batch: 360-55414
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	10.2	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-26898-1

Method Blank - Batch: 360-55220

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-55220/18
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 1012
Date Prepared: N/A

Analysis Batch: 360-55220
Prep Batch: N/A
Units: umhos/cm

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-55220

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-55220/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 0912
Date Prepared: N/A

Analysis Batch: 360-55220
Prep Batch: N/A
Units: umhos/cm

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1410	100	85 - 115	

Duplicate - Batch: 360-55220

Method: SM 2510B
Preparation: N/A

Lab Sample ID: 360-26898-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 02/19/2010 0958
Date Prepared: N/A

Analysis Batch: 360-55220
Prep Batch: N/A
Units: umhos/cm

Instrument ID: Autotitrator
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	700	701	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

State Accreditation Matrix

Method Name	Description	State where Primary Accreditation is Carried				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-26898-1

Login Number: 26898

List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

TestAmerica Laboratories, Inc.

Chain of Custody Form

TestAmerica

360 26878

53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

Client: Olin Chemical/MACTEC

Project #: 6107-09-0016-04

Address: 51 Eames Street

Project Manager: P. Thompson

Wilmington, MA 01887

Work ID: **Surface Water**

Phone:

Fax:

Requested Turn Around Time

10 Business Day (Std) XX Rush TAT Requested:
24 hrs 72 hrs
15 Business Day 48 hrs 5 Day
Other

Regulatory Classification / Special Report Format

NPDES Drinking Water DEP Form(s)
RCRA MCP GW/IS1 MWRA Smart Rpt
Other MCP QA/QC Rpt XX

Shaded areas for office use
Analysis Requested
Check analysis and specify method and analytes in comments section.
For example:
500-series for drinking water
600-series for waste water
8000-series for hazardous waste
Use comments section to further define.

Comments

(Special Instructions)

MCP case narrative

Sample Type Codes
WW-Wastewater DW-Drinking water SW-Surface water
LW-Labwater GW-Groundwater A-Air
S-Solid / Soil SL-Sludge O-Oil Z-Other

Sample ID

Sample ID	Sample Type	Sampler's Initials	Date Collected	Grab	Comp.	# Containers	Plastic(P) or Glass(G)	Preservative						Ammonia-Nitrogen	Chloride, Sulfate	Specific Conductivity	Nitrate, Nitrite	Diss Al/Cr/Na by 6010B	Tot. Al/Cr/Na by 6010B	Other	Other	Other	Other	Other	Other
								NaHSO4/MeOH	HNO3 to pH <2	H2SO4 to pH <2	HCl to pH <2	NaOH to pH >12	NAOH/ZNAC	None / 4° C											
OC-SW-15CO-3-0.2	SW	MAN	2-18-10 8:45	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-15CO-2-0.2	SW	MAN	2-18-10 9:00	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-16PR-0.2	SW	MAN	2-18-10 9:30	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-16PR-0.2	SW	MAN	2-18-10 9:30	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-17RR-0.2	SW	MAN	2-18-10 9:50	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-SD-17-0.2	SW	MAN	2-18-10 10:00	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-18R-0.2	SW	MAN	2-18-10 10:35	X		4	P	2	1					1	X	X	X	X	X						
OC-SW-15CO-1-0.2	SW	MAN	2-18-10 10:45	X		4	P	2	1					1	X	X	X	X	X						
			2/18/2010																						

Signature

Sampled by (print): Mark Magliore

Relinquished by: David Chapman

Date: 2/18/10

Time: 14:48

Received by: [Signature]

Date: 2/18/10

Time: 1448

Relinquished by: [Signature]

Date: 2/18/10

Time: 1520

Received by: [Signature]

Date: 2-18-10

Time: 1520

Method of shipment:

2-18-10

1655

TestAmerica-Westfield

2-18-10

1655

Dissolved metals are field filtered.

Analysis--

Ammonia Nitrogen--Lac 107-06-98
Chloride/sulfate--EPA 300
Specific Conductivity--SM 2510B
Nitrate/Nitrite--EPA 300
48 hour hold time on NO2, NO3

ID changes made
Per David Chapman
2/21/10

Cooler 1 N Samples Iced 1 N

Temp @ receipt: 0.6°C

Preservation pH checked

By: [Signature] Date: 2/18/2010

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Tige Cunningham 6/22/10
Sr. Review/Date Chris Ricard 6/25/10
Lab Report # 360-29898-1
Project # 6107100016-12

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

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1.5 Sample Receipt Information (*Cooler Receipt Form present?*):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|--|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable | | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

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☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☒ SOW ☐ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

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ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☒ No ☐ N/A ☐ Comments:

Chromium $1.6 \mu\text{g/L} \times 5 = 8 \mu\text{g/L}$
No chromium hits $\neq 8 \mu\text{g/L}$
No action needed

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If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

<u>Sample Type</u>	<u>MADEP % Rec</u>
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

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6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

- 6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes ☐ No ☒ N/A ☐

Comments: *However sample
OC-SW-ISCO-3-0.2
was spiked as a
Batch QC sample*

ACTION: If no, contact senior chemist to see if any were specified.

- 6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes ☒ No ☐ N/A ☐

Comments: *Batch QC sample*

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

- 6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes ☐ No ☐ N/A ☒

Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

- 6.4 Are any metal spike recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐

Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
 SR = Sample result
 SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

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NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$

Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: *MADEP refers to this sample as a "matrix duplicate".*

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

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MADEP Laboratory Duplicate Sample RPD Criteria:

For aqueous results $> 5 \times RL$, RPD must be $\pm 20\%$

For aqueous results $< 5 \times RL$, RPD must be $\leq RL$

For soil/sediment results $> 5 \times RL$, RPD must be $\pm 35\%$

For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$

QAPP RPD

20

20

20

20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒

No ☐

N/A ☐

Comments:

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9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

Sodium results in the dissolved fraction were $> 10\%$ of the concentration reported in the total fraction for

Dissolved results were higher in a subset of samples for Sodium, however the dissolved concentration was $< 10\%$ higher than the total. (TC)

Samples: OC-SW-SD-17-0.2 & OC-SW-ISCO-1-0.2

Sodium (J) estimated in Total & dissolved fraction

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10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☒

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

• for total/dissolved
concentrations > 10%

REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999

U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

Reviewer/Date Tige Cunningham 6/22/10
Sr. Review/Date Chris Riccardi 6/25/10
Lab Report # 300-26898-1
Project # 61071000 16-12

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative: Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed? Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|---|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input checked="" type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion | <input checked="" type="checkbox"/> clean-up and analysis, where applicable | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Yes ☐ No ☒ N/A ☐ Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

Yes ☒ No ☐ N/A ☐ Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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3.2 Are the practical quantitation limits the same as those specified by the **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**
☒ QAPP/IRSWP ☐ Lab?

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input checked="" type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond.** <input type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

ACTION: If no, contact the lab for submission.

4.0 Method Blanks **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).

Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits?

Yes ☐ No ☒ N/A ☐ Comments:

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LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits= _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes ☒ No ☐ N/A ☐

Comments: but not collected as samples. Lab analyzed MS/MSD as batch QC

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes ☒ No ☐ N/A ☐

Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

Yes ☒ No ☐ N/A ☐

Comments:

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐

Comments:

MS/MSD analyzed for Nitrate/Nitrite Sulfate/Chloride

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NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

SA = Spike added

Where: SSR = Spiked sample result
SR = Sample result

MS/MSD Recovery Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) <input checked="" type="checkbox"/> = 75-125%
Chloride*(SM 4500 Cl) <input checked="" type="checkbox"/> = 75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* <input type="checkbox"/> = 75-125%	COD High* <input type="checkbox"/> = 75-125%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%
Nitrite Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%	Hardness* <input type="checkbox"/> = 75-125%	Sulfate (EPA 300.0)* <input type="checkbox"/> = 75-125%	pH* = NA TSS* = NA
Other parameter(list) _____ % R = _____ <input type="checkbox"/> Rec Limits = _____			

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where S = MS result
D = MSD result

Yes ☐ No ☒ N/A ☐ Comments:

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes ☒ No ☐ N/A ☐ Comments:

for conductivity only

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ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity *☒ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments:

9.2 Were field duplicates collected per the required frequency?

Yes ☒ No ☐ N/A ☐ Comments:

QAPP/IRSWP ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☒ No ☐ N/A ☐ Comments:

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ACTION:. Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES:-

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Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.